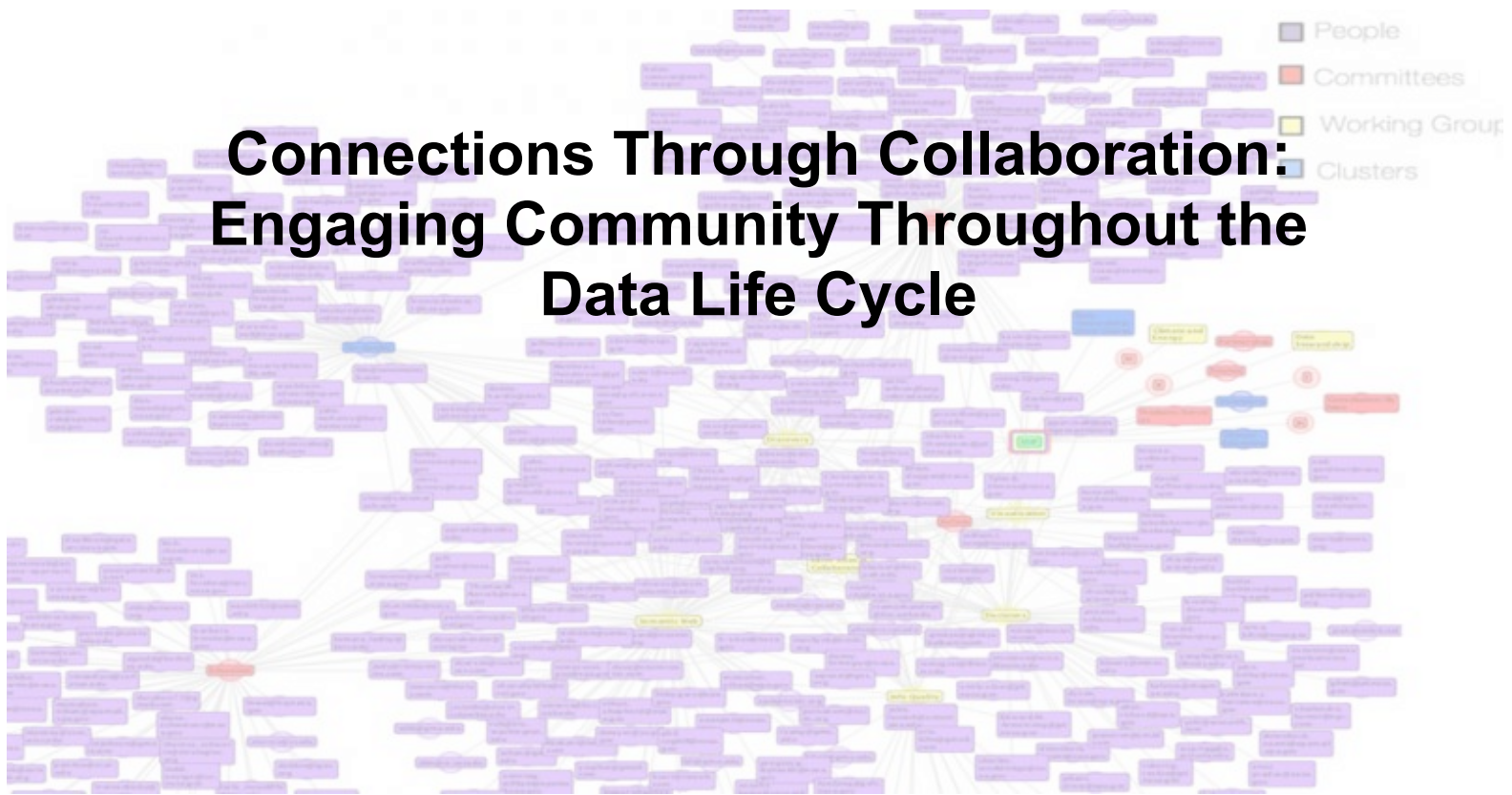


Federation of Earth Science Information Partners **Guide to Winter Conference 2012**

Connections Through Collaboration: Engaging Community Throughout the Data Life Cycle



January 4-6, 2012
Renaissance DuPont Circle Hotel
Washington, DC

The Foundation for Earth Science gratefully acknowledges the support it receives from NASA and NOAA in making the ESIP Federation community and its meetings possible. Further, we also acknowledge the tremendous volunteer support we receive from you, members of our community, whose contributions and expertise make the ESIP Federation the dynamic organization it has become.

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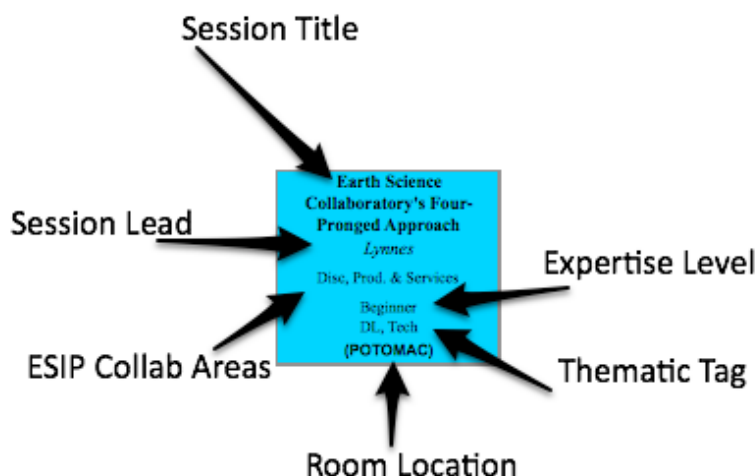
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Program Overview

Welcome to the ESIP Winter Meeting 2012! This meeting will focus on the theme: **Connections Through Collaboration: Engaging Community Throughout the Data Life Cycle.**

With increasing attention being paid to data systems interoperability both within and across science disciplines, the ESIP Federation plays an important role in bringing together organizations and individuals who make the connections - both human and technical - necessary to achieve integrated science. Speakers have been invited to represent academic, public and philanthropic interests, all with a goal toward understanding new ways to measure how Earth science information is used. Breakout sessions will be led by several of the ESIP Federation's committees, clusters and working groups addressing both the technological and societal benefit challenges within our community.

The program is laid out by day, starting with an 'at-a-glance' page followed by session abstracts for that day. Based on feedback from previous meetings, we have begun to tag each session with additional information. The figure below shows how the information is encoded.



ESIP collaboration areas are the ESIP clusters, working groups and committees that submitted or collaborated on the session. The following collaboration areas supported the ESIP Federation meeting:

- Air Quality
- CF Standards
- Cloud = Cloud Computing
- CCEWG = Climate Change Education Working Group
- Data Pres = Data Preservation & Stewardship
- Decisions
- Disc=Discovery
- Drupal
- Energy and Climate
- ESC = Earth Science Collaboratory
- Edu = Education
- GIS = Geographic Information System
- IT&I = Information Technology and Interoperability
- Internal Education
- P&S = Products and Services
- Semantic Web

While all listed sessions are open to anyone attending the meeting, **expertise level** is a suggested level of knowledge needed for the session. Most sessions require little prior knowledge and are open to everyone. A few

more technical sessions are listed at apprentice or journeyman level indicating that some background knowledge about the topic area is needed to participate fully.

Thematic tags are general topics that group sessions together across collaboration areas. The following categories were used:

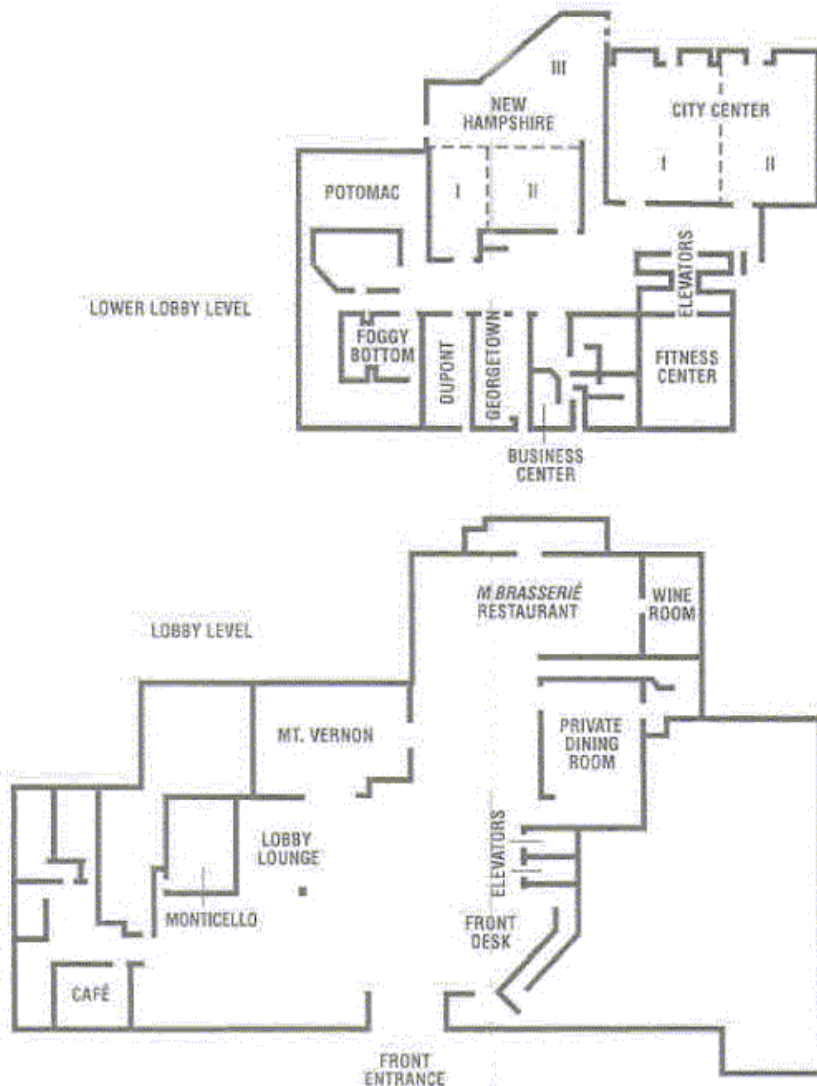
- **Data Life Cycle (DL)** - Data Lifecycle sessions are focused on all aspects of the data lifecycle.
- **Education (Edu)** - Education sessions are geared toward professional development and communication.
- **Organizational (Org)** - Organizational sessions are about coordination within ESIP, business meetings for various clusters, working groups and committees as well as strengthening ties between ESIP and partner organizations. ESIP 101 provides an introduction to ESIP for new (or returning) members will be held as a concurrent session on Wednesday from 2:00-3:30.
- **Societal Benefit (SB)** - Societal Benefits are the domain specific groups such as Air Quality and Energy.
- **Technology (Tech)** - Technology sessions include topics such as Open Source software development, Drupal coordination, cloud computing and work being done by two new clusters – Discovery and the Earth Science Collaboratory.

Hotel Map & Housekeeping

Poster set-up is during the afternoon break on Wednesday, Jan. 4. Poster presenters are responsible for set-up during the Wednesday break and teardown of posters after the reception. Foundation staff and volunteers are not responsible for lost posters or poster tubes.

Cell phone reception is known to be spotty in the lower level of the hotel. For better reception, please use the hotel lobby on the main level.

Wireless code: esip



Special Events

Martha Maiden Lifetime Achievement Award for Service to the Earth Science Information Community

In honor of Martha E. Maiden's leadership, dedication and tireless efforts to nurture the ESIP Federation into a vibrant and mature organization, this award was established in 2009 to recognize outstanding service to the Earth science information community. This award honors individuals who have demonstrated leadership, dedication and a collaborative spirit in advancing the field of Earth Science information.

This award is named for Martha E. Maiden, NASA Program Executive for Earth Data Systems. Ms. Maiden is widely credited for nurturing the ESIP Federation in its infancy and has overseen its growth and maturity. This award will be presented on a regular basis, but not less than one time each year.

Time: Lunch on January 4

ESIP President's Award

This award honors an individual who has made the most significant contribution to the Federation in the previous year. This award will be given annually at the ESIP Winter Meeting. The awardees receive a plaque.

Time: Lunch on January 4

ESIP Student Fellow Recognition

This year, the ESIP Federation created a Student Fellowship program for graduate students with research interests that align with ESIP activities. Six students worked with ESIP collaboration areas this year. We will recognize our six inaugural student fellows with a certificate of appreciation for their contributions to the ESIP committees, working groups and clusters that they supported.

Time: Lunch on January 4

Wednesday, January 4, 2012 – At-A-Glance

7:00 am – 5:30 pm	Registration (LOWER LEVEL FOYER)				
8:45 am – 9:00 am	Welcome Remarks, President Chris Lenhardt (NEW HAMPSHIRE)				
9:00 am – 9:45 am	Tim Killeen, Assistant Director, Directorate for Geoscience, National Science Foundation (NEW HAMPSHIRE)				
9:45 am – 10:30 am	Jack Kaye, Associate Director for Research of the Earth Science Division (ESD), NASA's Science Mission Directorate (SMD) (NEW HAMPSHIRE)				
10:30 am – 10:45 am	Coffee Break (LOWER LEVEL FOYER)				
10:45 am – 12:30 pm	Panel Discussion/Town Hall on Collaboration & Partnerships with: Gary Foley (EPA), Lawrence Friedl (NASA), Kevin Gallagher (USGS) and Zdenka Willis (NOAA/IOOS); Moderated by Karl Benedict (UNM) (NEW HAMPSHIRE)				
12:30 pm – 2:00 pm	Lunch with Award Presentations (CITY CENTER)				
2:00 pm - 3:30 pm	Earth Science Collaboratory's Four-Pronged Approach	Energy: Dynamic Decision Tools Catalog and Community of Practice*	Applying GIS for Integrated Discovery, Access, and Analysis	ESIP 101	Realizing the Benefit of (Re-) using Open Source Software
	<i>Lynnes</i>	<i>Eckman, Kumar</i>	<i>Bagwell, Raskin</i>	<i>Lenhardt, Meyer</i>	<i>Mattman</i>
	Disc, Prod. & Services Beginner DL, Tech	Energy & Climate Beginner SB, Tech	GIS Beginner Tech	ExCom Beginner Org	Disc, ESC, ESDSWG Software Reuse WG Beginner DL, Tech, Org
	(POTOMAC)	(FOGGY BOTTOM)	(DUPONT)	(GEORGETOWN)	(MT. VERNON)
3:30 pm – 4:00 pm	Coffee Break and Poster Set-Ups (LOWER LEVEL FOYER)				
4:00 pm - 5:30 pm	Semantic Web Demo	Energy: Dynamic Decision Tools Catalog and Community of Practice*	Geoportal Server: Open Source Software for Data Discovery and More*	Assessing and Addressing ESIP's Professional Development Needs	Drupal as a Platform for Collaboration and Semantic Web: Capabilities, Use Cases, and Community
	<i>Wilson</i>	<i>Eckman, Kumar</i>	<i>Yuanjie, White</i>	<i>Dahlman, Mooney, Student Fellows</i>	<i>Caron, Pan</i>
	Semantic Web, ESDSWG TIWG Beginner Tech, SB	Energy & Climate, AQ Beginner SB, Tech	Disc., Prod. & Services Beginner Tech	CCEWG, Educ, Prof. Dev. Beginner Org, Tech	Drupal Beginner Tech
	(POTOMAC)	(FOGGY BOTTOM)	(DUPONT)	(GEORGETOWN)	(MT. VERNON)
5:30 pm – 7:30 pm	Reception & Poster Session (CITY CENTER)				

* Remote Access

Wednesday, January 4 - Session Descriptions, 2:00-3:30

Earth Science Collaboratory's Four-Pronged Approach

Room: POTOMAC

Session Lead(s): Lynnes

Description: Join us to develop strategies in the four key areas to establish an Earth Science Collaboratory:

- (a) Technical: architecture, design, implementation
- (b) Sociological: what induces scientists to share (or not share) knowledge, tools, methods and results?
- (c) User Stories: what pivotal science research, education and application results will the ESC enable?
- (d) Programmatic: how do we best leverage agency, academic, non-profit and commercial programs to actually realize the ESC?

ESIP Collaboration Areas: Disc, Prod. & Services

Expertise Level: Beginner

Topic tags: DL, Tech

Energy: Dynamic Decision Tools Catalog and Community of Practice *

Room: FOGGY BOTTOM

Session Lead(s): Eckman, Kumar

Description: One of the challenges Federal agencies face when reviewing energy related projects (e.g. wind power site selection) is a method to assess risks associated with those projects. Developers proposing these projects and NGOs evaluating environmental impacts have similar concerns. There are a number of tools that can be used but they don't have the transparency in terms of the models used, and the data that went behind the tools. What could help is a dynamic decision tools catalog and community of practice to build transparency of the decision tool architecture, data, and functionality. This would aid the decision maker in tool selection and use appropriate to their planning goals and help identify gaps and improvements needed to the kit of decision tools.

ESIP can play a coordinating role by engaging universities and industry along with the Federal agencies and NGOs in a cross-sector understanding of the needs, maintaining such a catalog of decision tools, engaging the community in a dialog and discussion, and facilitating partnerships in further tool development and application. Some of the Federal agencies that could have interest in this project and have related initiatives are Fish and Wildlife Service, USGS, DoE, NREL, and Bureau of Land Management.

The purpose of this workshop is to bring government agencies, researchers, and developers together to identify what the stakeholder needs are and discuss an approach we could take (as a group participating within ESIP) to address this problem. One of the targeted outcomes is a framework for ESIP to undertake this project. A white paper will be generated to capture the results that could serve as a statement of needs for the Federal agencies to consider RFI/RFPs.

Presentations in this session are on Agency / End User Needs:

- DOE Wind Power Installation Requirements – Patrick Gilman / Stan Calvert, DOE
- USGS Sustainability Requirements – Kevin Gallagher/ Sky Bristol, USGS
- Current tools and Gaps - Laurie Allen, USGS

ESIP Collaboration Areas: Energy & Clim.

Expertise Level: Beginner

Topic tags: SB, Tech

* Remote Access

Wednesday, January 4 - Session Descriptions, 2:00-3:30 (cont.)

Applying GIS for Integrated Discovery, Access, and Analysis

Room: DUPONT

Session Lead(s): Bagwell, Raskin

Description: This interactive session will apply use cases to demonstrate how complete end-to-end solutions can be achieved using GIS - without the need to leave this software environment. A GIS can provide discovery services to locate non-scientific and scientific data, access services to obtain and overlay this data, and analysis services to carry out scientific analysis. This session will help kickoff the restart of the ESIP GIS Cluster.

ESIP Collaboration Areas: GIS

Expertise Level: Beginner

Topic tags: Tech

ESIP 101

Room: GEORGETOWN

Session Lead(s): Lenhardt, Meyer

Description: As the ESIP Federation has grown in size and scope of activities, many new faces have been drawn into our community. For those new to the ESIP Federation or anyone interested in learning more about its activities, join us for an overview presentation that will highlight the history, current activities, opportunities for involvement and how to become a partner. Bring your burning questions to this informal session.

ESIP Collaboration Areas: Executive Committee

Expertise Level: Beginner

Topic tags: Org

Realizing the Benefit of (Re-) using Open Source Software

Room: MT. VERNON

Session Lead(s): Mattman

Description: This session will build upon last Summer's 2011 ESIP Federation Open Source in the Sciences Workshop that Chris Mattman led. He intends to cover a host of topics in open source software and how best to use it and develop it for your agency. This includes:

- Commercialization/Licensing/Redistribution issues
- Legal/IP
- Community Building
- Successful Governance Models
- Examples of useful open source software
- Best practices for Community interaction

The session will be interactive, and will also feature a panel of selected experts to discuss their experience in the open source community at various agencies including NASA, DOE and the NSF."

ESIP Collaboration Areas: Disc, ESC, ESDSWG Software Reuse WG

Expertise Level: Beginner

Topic tags: DL, Tech, Org

Wednesday, January 4 - Session Descriptions, 4:00-5:30

Semantic Web Demo

Room: POTOMAC

Session Lead(s): Wilson

Description: There will be series of 15-minute demos of tools and applications using semantic technologies:

- Introduction (Brian Wilson)
- Linked Open Data for AGU Abstracts, Sessions, & People (Eric Rozell, Tom Narock)
- The ESIP Collaboration Network (Erin Robinson)
- Noesis 2.0: Smart Search for Collections & Services (Rahul Ramachandran)
- Saving & Querying Production Provenance Graphs using RDF (Hook Hua)
- Graph Visualization Tools (Ruth Duerr, Joe Glassy)

ESIP Collaboration Areas: Semantic Web

Expertise Level: Beginner

Topic tags: Tech, SB

Energy: Dynamic Decision Tools Catalog and Community of Practice^{*}

Room: FOGGY BOTTOM

Session Lead(s): Eckman, Kumar

Description: For full description see Wednesday Breakout, 2-3:30.

4:00-4:45 Current implementations, Gap Analysis

- Open EI and energy.data.gov, Robert Bectel, DOE
- GIS-based Tools, Madeleine West, Western Governors Association
- Geosciences Network, Steve Richards

4:45 – 5:30 PM Energy and Air Quality Joint Session

- Public-Private Partnership – Open Discussion

ESIP Collaboration Areas: Energy & Clim.

Expertise Level: Beginner

Topic tags: SB, Tech

Geoportal Server: Open Source Software for Data Discovery and More^{*}

Room: DUPONT

Session Lead(s): Yuanjie

Description: The goal of this session is to introduce geoportal as one of the data discovery and access services from the US National Oceanographic Data Center (NODC) and other NOAA data centers.

1. Christine White (ESRI)- Introducing Geoportal Server-12 minutes
2. Ken Casey (NODC)-Bringing it all together: NODC's Geoportal Server as an integration tool for interoperable data services (possible topic) -12 minutes –a little beyond the discovery

^{*} Remote access provided

Wednesday, January 4 - Session Descriptions, 4:00-5:30 (cont.)

3. John Relph (NODC)-NODC Metadata Management for Geoportal Server and Beyond-12 minutes
4. Dave Neufeld (NGDC)-Progress from NGDC on Geoportal's ISO metadata implementation (possible topic)-12 minutes
5. David Parrish (EPA)-Progress from EPA on Geoportal Server Implementation with a demo-12 minutes
6. Yuanjie Li (NODC)-Progress from NODC on Geoportal Server and some usability test results from AGU (possible topic)-12 minutes

ESIP Collaboration Areas: Disc., Prod. & Services

Expertise Level: Beginner

Topic tags: Tech

Identifying and Addressing ESIP's Communication and Professional Development Needs

Room: GEORGETOWN

Session Lead(s): Dahlman

Description: This debut session of ESIP's newest working group will showcase the results of a needs assessment conducted by our inaugural group of student interns. Through the fall of 2011, the interns interviewed key ESIP members about their communication- and education-related challenges. The Communication and Education Services Working Group will share results of the interviews and provide overviews of a range of solutions to the most commonly cited challenges.

ESIP Collaboration Areas: CCEWG, Educ, Prof. Dev.

Expertise Level: Beginner

Topic tags: Org, Tech

Drupal as a Platform for Collaboration and Semantic Web: Capabilities, Use Cases, and Community Adoptions

Room: MT. VERNON

Session Lead(s): Caron, Pan

Description: We have invited Acquia's Sean Crowley and Chris Brown to speak about the benefits of Drupal as a platform for collaboration and semantic web. Topics will be covered include: Drupal's capability in collaboration and semantic web, Drupal's adoption rates in government and science community, collaboration use cases, and Drupal's advantages. In addition to a formal presentation, the session will include open, interactive discussions on any Drupal technical or business issues.

ESIP Collaboration Areas: Drupal

Expertise Level: Beginner

Topic tags: Tech

Thursday, January 5, 2012 – At-A-Glance

7:00 am – 5:30 pm	Registration (LOWER LEVEL FOYER)				
7:45 am – 8:30 am	Proposed ESIP Membership Tiers: Breakfast Discussion (NEW HAMPSHIRE)				
8:45 am – 9:30 am	Adrian Gardner, CIO, NASA Goddard, Data Access and Storage of Earth Science Data in the Cloud – Experiments in Collaboration (NEW HAMPSHIRE)				
9:30 am – 10:15 am	William Gunn, Mendeley Ltd., Mendeley's Evolving Network of Expertise (NEW HAMPSHIRE)				
10:15 am – 10:45 am	Coffee Break (LOWER LEVEL FOYER)				
11:00 am – 12:30 pm	2012 Annual Business Meeting (CITY CENTER)				
12:30 pm – 2:00 pm	Lunch with talk Ed Maibach, Director, Center for Climate Change Communication (4C), Professor, GMU, "Engaging the public in earth sciences: Five Guiding Principles" (NEW HAMPSHIRE)				
2:00 pm - 3:30 pm	NASA Cloud Computing Panel <i>Huang, Little - Maddux</i>	Energy: Dynamic Decision Tools Catalog and Community of Practice* <i>Eckman, Kumar - Zaerpoor</i>	Technology Tools that Enhance Collaboration: Solutions from Climate Change Education Initiatives* <i>Dahlman, Ledely, Mooney, Reid - Roberts/Rozell/Aulov</i>	Evaluation Workshop: The Case for Project Evaluation <i>Prados, Burke, Ferguson - Hartley</i>	Discovery Workshop <i>Hua, Lynnes - Rozell/Narock</i>
	Cloud Journeyman Tech, DL, SB, Org	Energy & Clim. Beginner SB, Tech	CCEWG, Drupal, Edu, IT&I, Prof. Dev. Beginner Org, Tech	Decisions Beginner Org	Disc. Apprentice Tech
	(POTOMAC) - CM	(FOGGY BOTTOM)	(DUPONT) ER	(CITY CENTER) CM	(MT. VERNON) ER
3:30 pm – 4:00 pm	Coffee Break (LOWER LEVEL FOYER)				
4:00 pm - 5:30 pm	ESIP Cloud Computing Testbed Initiative <i>Martin, Yang - Aulov</i>	Energy: Dynamic Decision Tools Catalog and Community of Practice* <i>Eckman, Kumar - Zaerpoor</i>	Emerging Provenance and Context Content Standard <i>Ramapriyan - Maddux</i>	Evaluation Workshop: The Case for Project Evaluation <i>Prados, Burke, Ferguson - Hartley</i>	Linking Earth Sciences and GEOSS: The role of the GEOSS User Requirement Registry (URR) <i>Foley, Plag - Roberts</i>
	Cloud, Prod & Services Apprentice Tech	Energy & Climate Beginner SB, Tech	Data Pres. Apprentice DL	Decisions Beginner Org	GEO Beginner Tech, SB, DL, Org
	(POTOMAC) ER	(FOGGY BOTTOM)	(DUPONT)	(CITY CENTER)	(MT. VERNON) CM

*Remote Access

Thursday, January 5 - Session Descriptions, 2:00-3:30

NASA Cloud Computing Panel

Room: POTOMAC

Session Lead(s): Huang, Little

Description: This session is to discuss the current status of NASA cloud computing activities: 1) Mike Little will introduce the SMD strategy for adopting cloud computing and a cloud computing test initiative, 2) JPL Earth science program office will introduce their current cloud activity and strategy, 3) Ames Nebula Team (Keith) will introduce the current Nebula cloud environment and activities. Each topic will be 15 minutes, Q&A, and discussions will be following the presentations.

ESIP Collaboration Areas: Cloud

Expertise Level: Journeyman

Topic tags: Tech, DL, SB, Org

Energy: Dynamic Decision Tools Catalog and Community of Practice *

Room: FOGGY BOTTOM

Session Lead(s): Eckman, Kumar

Description: For full description see Wednesday Breakout, 2-3:30.

Next Steps and Technology Solutions

- ESIP Semantic Web Cluster Activities and Relevance to the ESIP Energy and Climate Cluster, Peter Fox (RPI), ESIP Semantic Web Cluster Chair

This presentation will introduce semantic web methods, technologies and applications in general as well as those of specific interest to ESIP as a whole and specific committees, working groups and clusters. We will then proceed to a discussion of relevant activities of interest to the ESIP Energy and Climate Cluster as well as opportunities for future collaboration between the clusters.

- OGC standards and Architecture Scenarios, Karl Benedict, UNM

ESIP Collaboration Areas: Energy & Clim.

Expertise Level: Beginner

Topic tags: SB, Tech

Technology Tools that Enhance Collaboration: Solutions from Climate Change Education Initiatives *

Room: DUPONT

Session Lead(s): Dahlman, Ledley, Mooney, Reid

Description: This session will feature technology tools that enable collaboration without travel (and minimum carbon) as presented by ESIP members who use these tools in Climate Change Education initiatives. Demonstrations will be accompanied by a discussion of associated best practices. Below is a list of most of the tools that we'll feature:

- join.me - instantly share your screen with others (for free!)
- Google Sites - collaborate over the same document
- Google Forms - use a survey to identify group priorities
- Webinars - teach a seminar and interact remotely with multiple participants

* Remote Access

Thursday, January 5 - Session Descriptions, 2:00-3:30 (cont.)

- EET - give educators an introduction to analyzing your data
- Mobile Apps - share data anywhere with anyone
- Drupal - icommons, online workspaces and more
- ESIP Teacher Wiki - staying connected remotely

ESIP Collaboration Areas: CCEWG, Edu, Prof. Dev., Drupal
Expertise Level: Beginner
Topic tags: Org, Tech

Evaluation Workshop: The Case for Project Evaluation

Room: CITY CENTER

Session Lead(s): Prados, Burke, Ferguson

Description: Continuing with the theme from the 2011 Winter meeting related to evaluation, this hands-on workshop will focus on 1) why one evaluates data and their associated enabling technologies for discovery and distribution and 2) some basic methods for getting started with evaluating the impact of your own research or products.

On day one we'll start with a short overview of some examples of evaluation and assessment projects, then move into a discussion of some basic methods for understanding two critical elements of evaluation: who are your main stakeholders and how you can interact with them so that you can understand better how your work is being used and what impact it's having.

Workshop sponsored by the Decisions Cluster and conducted by Brian Burke, CTG at SUNY Albany and Dan Ferguson, University of Arizona.

ESIP Collaboration Areas: Decisions
Expertise Level: Beginner
Topic tags: Org

Discovery Workshop

Room: MT. VERNON

Session Lead(s): Hua, Lynnes

Description: The set of ESIP Discovery services encompass the overlapping conventions of Earth science federated OpenSearch, Collection Casting, Granule Casting, and Service Casting feed standards. This workshop will show some demonstrations of how Discovery services can be practically applied to facilitate collaborations by enabling sharing of services and data.

This session will focus on the top two voted topics:

- A. Interoperability for OGC services (45-min)
- B. Interoperability for OpenSearch in various types of casting (45-min)

ESIP Collaboration Areas: Disc.
Expertise Level: Apprentice
Topic tags: Tech

Thursday, January 5 - Session Descriptions, 4:00-5:30

ESIP Cloud Computing Testbed Initiative

Room: POTOMAC

Session Lead(s): Martin, Yang

Description: A progress report and discussion about what is needed to support a cloud computing testbed for producing lessons learned and best practice for ESIP members to assess, test, and adopt cloud platforms for their research, development, and education: 1) discuss the matrix of requirements for cloud computing by ESIP members, 2) identify the possibility of cloud resources (Amazon, Microsoft, Nebula, Private Cloud), 3) identify potential applications to be running on potential cloud resources, 4) an execution plan for the testbed with a target of presenting in the summer meeting.

- Earth Science Cloud Computing Requirements
- Testbed Initiative Introduction
- Testbed Ideas
 - Commercial Cloud Environment
 - Government Cloud Environment
 - ESIP Cloud Environment
- Testbed Coordination

ESIP Collaboration Areas: Cloud, Prod & Services

Expertise Level: Apprentice

Topic tags: Tech

Energy: Dynamic Decision Tools Catalog and Community of Practice

Room: FOGGY BOTTOM

Session Lead(s): Eckman, Kumar

Description: For full description see Wednesday Breakout, 2-3:30.

Next Steps and Technology Solutions

- Systems Architecture and Implementation , Stefan Falke, NGC
- Drupal-based Implementation – Rahul Ramachandran, UAH

ESIP Collaboration Areas: Energy & Clim.

Expertise Level: Beginner

Topic tags: SB, Tech

Thursday, January 5 - Session Descriptions, 4:00-5:30 (cont.)

Emerging Provenance and Context Content Standard

Room: DUPONT

Session Lead(s): Ramapriyan

Description: Provide a status update on the emerging Provenance and Context Content Standard (PCCS). Discuss details of use cases developed during the summer 2011 meeting and map them to the PCCS matrix. Discuss next steps.

ESIP Collaboration Areas: Data Pres.

Expertise Level: Apprentice

Topic tags: DL

Evaluation Workshop: The Case for Project Evaluation

Room: CITY CENTER

Session Lead(s): Prados

Description: Continued from 2-3:30 Session.

ESIP Collaboration Areas: Decisions

Expertise Level: Beginner

Topic tags: Org

Linking Earth Sciences and GEOSS: The role of the GEOSS User Requirement Registry (URR)

Room: MT. VERNON

Session Lead(s): Foley, Plag

Description: The User Requirement Registry (URR) of the Global Earth Observing System of Systems (GEOSS) is being developed as a versatile tool for the publishing of information on User Types, Applications, Observational and Information Requirements, Research Needs, Infrastructure Needs, Technology Needs, and Capacity Building Needs. Links can be described between any of the entries in these tables, in order to capture the inter-dependencies along the value chains from observations through value-adding applications down to the end users. A prototype of the URR was implemented in 2010 and further improved in 2011. In 2012, the finalization of the URR and the integration in the GEOSS Common Infrastructure (GCI) is planned.

The workshop will introduce the current URR and discuss the role of Earth scientists in the population of the URR with science and research related information. The plan for the final URR will be presented and a discussion will provide ample opportunity for participants to provide feedback on the URR plans. In particular, the URR should provide a communication tool for a dialog between ESIP and the Group on Earth Observations (GEO) concerning Earth science's observational needs and contributions to Earth observations.

The workshop "Building a User-Driven GEOSS: Methods to Capture, Analyze, and Prioritize User Needs," held on April 10, 2010 in Sydney, Australia, developed a number of recommendations (see http://www.geo-tasks.org/workshops/2011_Sydney/ws_report.php), and those recommendations relevant for ESIP will be discussed. We will present three examples in more details. The case of air quality monitoring and predicting will be used to illustrate the complexity of user types, applications, and requirements associated with this interdisciplinary field. The cases of disaster risk reduction highlight the relevance of research and infrastructure needs necessary to enable applications in this area. Integrated coastal zone management will be used to demonstrate a top-down analysis of the various needs in a field.

ESIP Collaboration Areas: GEO

Expertise Level: Beginner

Topic tags: Tech, SB, DL, Org

Friday, January 6, 2012 – At-A-Glance

7:00 am – 5:30 pm	Registration (LOWER LEVEL FOYER)				
7:45 am – 8:30 am	Public-Private Partnership Discussion (CITY CENTER)				
8:30 am - 10:00 am	Semantic Web Ontologies and Applications <i>Fox</i>	Air Quality <i>Bagwell, Dye, Lough</i>	IT & I ESIP Commons Review <i>Ramachandran</i>	Evaluation Workshop: A Framework for Project Evaluation <i>Prados, Burke, Ferguson</i>	Preservation and Stewardship Planning <i>Duerr, Tilmes</i>
	Semantic Web Apprentice Tech	Air Quality Beginner SB, Tech	IT&I Beginner Tech, Org	Decisions Beginner Org	Data Pres. Beginner DL, Org
	(POTOMAC)	(FOGGY BOTTOM)	(DUPONT)	(CITY CENTER)	(MT. VERNON)
10:00 am – 10:30 am	Coffee Break (LOWER LEVEL FOYER)				
10:30 am - 12:00 pm	The ESIP Testbed - An Infrastructure for Community Collaboration <i>Keiser</i>	Disaster BoF	CF Standards Extensions for Remote Sensing Data <i>Raskin</i>	Evaluation Workshop: A Framework for Project Evaluation <i>Prados, Burke, Ferguson</i>	Discovery Cluster Planning <i>Hua, Lynnes</i>
	Cloud, Prod. & Services Apprentice Tech, DL	Beginner SB, Tech	CF Beginner DL	Decisions Beginner Org	Disc. Apprentice Org, Tech
	(POTOMAC)	(FOGGY BOTTOM)	(DUPONT)	(CITY CENTER)	(MT. VERNON)
12:00 pm – 1:30 pm	Lunch (NEW HAMPSHIRE)				
1:30 pm - 3:00 pm	Earth Science Collaboratory Charrette <i>Lynnes</i>	Education Committee <i>Caron</i>			
	ESC Beginner DL, Tech	Edu. Beginner Org			
	(POTOMAC)	(FOGGY BOTTOM)			
3:00 PM	Meeting Adjourns				

* Remote Access

Friday, January 6 - Session Descriptions, 8:30-10:00

Semantic Web Ontologies and Applications

Room: POTOMAC

Session Lead(s): Fox

Description:

- Data Quality Screening Service (Chris Lynnes)
- Review of goals/outcomes of this Meeting
- Erin will demonstrate ESIP Network progress
- Eric/Tom will give more updates/questions about ESIP project
- Cluster Collaborations:
 - Information Quality
 - Energy and Climate
 - Discovery
 - Preservation and Stewardship

ESIP Collaboration Areas: Semantic Web

Expertise Level: Apprentice

Topic tags: Tech

Air Quality

Room: FOGGY BOTTOM

Session Lead(s): Bagwell, Dye, Lough

Description: Air Quality Workgroup meeting, including:

- 1) Update on new and current projects (CIERA, others)
- 2) Review of new Best Practices guidance (CyAir) and development/updating/management of a living guidance document
- 3) Implementation of the Community WCS server
- 4) Other topics TBD

ESIP Collaboration Areas: Air Quality

Expertise Level: Beginner

Topic tags: SB, Tech

IT & I ESIP Commons Review

Room: DUPONT

Session Lead(s): Ramachandran

Description: Over the years, ESIP wiki has served as a useful mechanism to capture knowledge and information. However, limitations of the ESIP wiki in providing a formal citable knowledge management system have led to the creation of the ESIP Intellectual Commons (iCommons).

The objectives of the ESIP iCommons are:

1. Provide a knowledge repository to formally capture and publish all the information and knowledge generated as part of ESIP activities
2. Provide a citation mechanism to acknowledge individuals and groups that generate new knowledge
3. Provide a publication medium for information that cannot be printed elsewhere such as technical reports, use cases, education modules.

The objective of this session is two-folds. First, to apprise the ESIP community of the current status and capabilities of the ESIP iCommons. Second, to solicit feedback to shape this knowledge management system to best serve the ESIP community

ESIP Collaboration Areas: IT&I
Expertise Level: Beginner
Topic tags: Tech, Org

Evaluation Workshop: A Framework for Project Evaluation

Room: CITY CENTER
Session Lead(s): Prados

Description: On day two, we'll work through a practical framework from the point of view of Public Value. In the most general sense, public value is linked to individual and societal interests and to the institutional forms and actions of government.

The CTG Public Value Framework uses the concept of public value to help government and those that work with government understand the tangible and intangible values that information can provide to multiple and often diverse stakeholders. The purpose of this workshop is to provide earth science information researchers and government practitioners with tools and strategies to help them better understand the value that the information they work with can or is providing to their various stakeholders. During the workshop, participants will learn about existing CTG methods and tools and how they can be used to help support the design, implementation, and evaluation of earth

Friday, January 6 - Session Descriptions, 10:30-12:00

science information projects and ensure that the value these projects can provide is identified, communicated, and assessed. Workshop sponsored by the Decisions Cluster and conducted by Brian Burke, CTG at SUNY Albany and Dan Ferguson, University of Arizona.

ESIP Collaboration Areas: Decisions
Expertise Level: Beginner
Topic tags: Org

Preservation and Stewardship Planning

Room: MT. VERNON
Session Lead(s): Duerr, Tilmes

Description: We will review status of the various active activities in the cluster and discuss future plans. Those activities include: Data Stewardship Principles, Preservation Use Cases, Identifiers, Citations, Provenance and Context Content Standard, and Preservation Ontology.

ESIP Collaboration Areas: Data Pres.
Expertise Level: Beginner
Topic tags: DL, Org

The ESIP Testbed - An Infrastructure for Community Collaboration

Room: DUPONT
Session Lead(s): Keiser

Description: This session is to discuss the progress of the P&S committee testbeds tasks and analyze how that can be supported by cloud computing or the requirements for computing infrastructure.

- Testbed Overview and promotion - maybe a standup survey? (Ken) (15 min)

- Quick poll of attendees - simple binary questions
- Did you know ESIP has a Testbed?
- Would you consider using cloud resources for your work?
- others?
- ESIP Front Office Perspective on the Testbed (Carol/Erin) (15 min)
 - Importance to the Federation
 - Options for expansion/moving forward
- Current Tasks - very brief overview (3 min each, 1-2 slides) (15 min)
 - Portal - Phil
 - *RemoDiscovery - Christine/Hook
 - Quality - Phil/Greg
 - Metadata - Jerry/Rahul
 - Preservation - Nancy
- Cloud Resources - A Testbed task, then the Testbed Infrastructure – (Phil) (15 min)
 - A testbed of cloud resources
 - A cloud to host testbed tasks/services
- Open Discussion (and buffer for going over on other presentations) (30 min)
 - When to move tasks from Testbed to Production
 - Other discussion topics?

ESIP Collaboration Areas: Cloud, Prod. & Services
 Expertise Level: Apprentice
 Topic tags: Tech, DL

Friday, January 6 - Session Descriptions, 10:30-12:00 (cont.)

Disaster BoF

Room: FOGGY BOTTOM
 Session Lead(s):

Description: This session is to gauge the interest of the ESIP community in starting a new Disaster Cluster.

ESIP Collaboration Areas:
 Expertise Level: Beginner
 Topic tags: SB, Tech

CF Standards Extensions for Remote Sensing Data

Room: DUPONT
 Session Lead(s): Raskin

Description: The CF metadata conventions were developed originally to meet the needs of the modeling community. We will discuss extensions needed to serve the needs of the remote sensing community, including: spectral band descriptions, swath geometry representation, and data quality representations.

ESIP Collaboration Areas: CF
 Expertise Level: Beginner
 Topic tags: DL

Evaluation Workshop: A Framework for Project Evaluation

Room: CITY CENTER
 Session Lead(s): Prados

Description: Day 2 of Evaluation Workshop. Continued from 8:30-10:00 am Session.

ESIP Collaboration Areas: Decisions

Expertise Level: Beginner
Topic tags: Org

Discovery Cluster Planning

Room: MT. VERNON

Session Lead(s): Hua, Lynnes

Description: In this joint Earth Science Collaboratory (ESC) and Discovery Cluster session, we will discuss and plan the direction of the Discovery Cluster for the coming year. With multiple Earth science data centers already implementing these Discovery services, a forum is needed to discuss planning, interoperability, community process issues for the Discovery services. We will also discuss how Discovery can contribute to the ESC vision.

This session will tentatively focus on other topics to push forward on.

- A. Draft DCP-3: Where do we go from here? (25-min)
- B. Faceting and Custom Fields Discussion (25-min)
- C. Some Lessons Learned from Apache Solr-based Faceting (10-min)
- D. Any Other Topics for Discovery? (10-min filler)
- E. Leveraging the Discovery Testbed (20-min)

ESIP Collaboration Areas: Disc.

Expertise Level: Apprentice

Topic tags: Org, Tech

Friday, January 6 - Session Descriptions, 1:30-3:00

Earth Science Collaboratory Charrette

Room: POTOMAC

Session Lead(s): Lynnes

Description: Earth Science Collaboratory Charrette*

We will begin to outline the feature list for the Earth Science Collaboratory. As a starting point, we will look at some desired features coming out of the EarthCube Charrette, asking questions like: is this appropriate for ESC, who benefits and how do they benefit? We will also entertain feature requests unique to the ESC.

*A charrette is a collaborative design session: <http://en.wikipedia.org/wiki/Charrette>

ESIP Collaboration Areas: ESC

Expertise Level: Beginner

Topic tags: DL, Tech

Education Committee

Room: FOGGY BOTTOM

Session Lead(s): Caron

Description: The ESIP Education Committee meeting will focus on plans for the Summer ESIP meeting, representation at education conferences, and the work of the two Education Committee working groups: Climate Change Education and Internal ESIP Education.

ESIP Collaboration Areas: Edu.

Expertise Level: Beginner

Topic tags: Org

Poster and Demo Abstracts

Posters are listed alphabetically, by submitter last name. Demos and Funding Friday 2011 winners are noted in the titles.

Human Sensor Networks: Use of Social Media and Self Organizing Maps for Automated Detection of Oil Spill Plumes in Satellite Observations (Funding Friday 2011)

Oleg Aulov, Milton Halem, David Lary

Water Horizon oil spill in the Gulf of Mexico in April 2010--can save lives, prevent property damage and help minimize environmental impact. During oil spill disasters, trained satellite analysts at NOAA/NESDIS process satellite observations and manually integrate data from numerous sources to produce a polygonal map that identifies the locations of possible detected oil on the surface of the ocean. These polygon maps are assimilated into an operational Lagrangian trajectory model driven by wind and ocean current data to forecast the movement of the oil. We demonstrate an automated algorithm to detect and map surface oil distributions from satellite observations. We employ a Self Organizing Map (SOM) machine learning algorithm. A SOM algorithm is a type of an unsupervised neural network that produces a low-dimensional representation of a higher dimensional input space while preserving its topological properties. This low order representation is called a map. Once the map is created we use social media data from human sensor networks together with other ground observations to determine which cluster represents the oil plume.

We demonstrate an automated approach to analyzing satellite imagery for oil plume detection. We use an unsupervised machine learning algorithm called Self Organizing Maps (SOM). An SOM algorithm is a type of an unsupervised neural network that produces a low-dimensional representation of a higher dimensional input space while preserving its topological properties. This representation is called a map. Once the map is created we use social media data from human sensor networks together with other ground observations to determine which cluster represents the oil plume.

Submitted by: Oleg Aulov, University of Maryland Baltimore County, aulov.oleg@gmail.com

Using NASA Remote Sensing Data in a Geographical Information System

Ross Bagwell, Francis Lindsay, Christopher Lynnes, Long Pham, Wenli Yang, Peisheng Zhao, Aijun Chen, MuQun Yang

NASA's Earth Observing System Data and Information System (EOSDIS) generates more than 2 Tb of remotely sensed data each day through multiple spacebased instruments and satellite platforms. The Earth Science Data Information Systems (ESDIS) project at the NASA Goddard Space Flight Center (GSFC) is focused on expanding the usage of EOS data in GIS applications, for both scientists and the general public – especially when science quality satellite products are readily obtainable in HDF-EOS format. The primary formats for NASA's EOS data are NetCDF, HDF4 (HDF-EOS2), and HDF5 (HDF-EOS5), of which the Federal Geospatial Data Committee (FGDC) only endorses NetCDF (out of a total of 64 external standards). The benefit of using a GIS includes the ability to interrelate multiple types of information assembled from a variety of sources to visualize, query, overlay, and analyze data, making it valuable to a wide range of scientific, academic and private entities. Some of the issues facing the remote sensing community for using these data include:

- Most GIS systems do not readily process or are unable to utilize NASA Remote Sensing (RS) data
- Many scientific users utilize specialized software to geolocate images, which presents a problem for interoperability between common systems- Headers in data files are not easily read by GIS systems
- Key NASA datasets are mostly available in either HDF-EOS or NetCDF formats
- GeoTIFFs cannot be directly created from HDF or NetCDF, creating a multi-step process that is not inherently user friendly (including reprojection, band extraction, and exporting)

With that in mind, EOSDIS has undertaken a number of steps toward aiding the use of these data by the broader GIS community:

- Support raster data geometry and integration of EOS data into a GIS, with functions for image processing, modeling, and spatial analysis

- Leverage relationships throughout the GIS community to enable the use of NASA RS data on the most commonly used platforms, focusing primarily on NetCDF, HDF4, and HDF5
- Meet the needs of scientists to enable them to use GIS as a tool to augment their work in the various communities by providing them with capabilities to translate, process, or analyze the data in a more common and cost-effective GIS that is more interoperable with other communities
- Assist the GIS community with understanding how to access and utilize EOS RS data in more commonly known and easily available GIS packages.

Submitted by: Ross Bagwell, NASA Goddard / CTS, ross.bagwell@nasa.gov

Enhanced Collaborative Disaster Management Through Interoperable Data Visualization (Funding Friday 2011)

Karl Benedict (Earth Data Analysis Center, UNM) & Rafael Ameller (StormCenter Inc.)

Rapid access to shared data and information is the key to successful planning and response to disasters. Many of the complex geoinformation (GIS) systems used today exist as standalone islands that were not designed to be interoperable. Thus, many of today's advanced systems do not currently work together from an overall mission or joint perspective. Additionally, despite all the advances in satellite and environmental data acquisition, processing and distribution, the "last mile", getting the data to the end user, is still the hardest part.

This poster presents the products of a collaboration between StormCenter Inc. and the Earth Data Analysis Center that was funded through the ESIP Federation's Funding Friday program in which general purpose time-enabled WMS services are packaged in KML for delivery specifically through the Envirocast® Vision™ Collaboration Module (EVCM) developed by StormCenter Inc., and also more generally through any client application that has implemented support for KML's temporal elements and WMS access model.

This project has resulted in:

- Increased integration of Earth Science data products into disaster planning and management through expansion of the data and products that may be integrated into the EVCM
- Increased system performance in the collaboration environment through the packaging of large data sets (potentially multi-TB in size) into KML with embedded WMS – delivering targeted map images instead of entire data sets
- Demonstrated the utility of integrating KML-wrapped WMS into the existing system – increasing the utility of published WMS services coming out of the Earth Science community (e.g. NASA NEO, NOAA NGDC)

Submitted by: Karl Benedict, Earth Data Analysis Center, UNM, kbene@edac.unm.edu

Skolr Digital Poster Service: from concept to service

Bruce Caron

The Skolr pilot project at the Summer 2011 ESIP Meeting proved the value of the Skolr concept: service the needs of meetings to realize more of the value of their poster sessions. This pilot also tested out Drupal as a development framework. The Skolr project is looking to build a robust digital poster service that any meeting can use to add value to their poster sessions. This poster will outline the lessons learned and the projected pathway forward to the fully implemented service.

Submitted by: Bruce Caron, New Media Research Institute, bruce@tnms.org

Towards Natural Language Programming for Geospatial Analysis

Upendra Dadi, Liping Di

It takes huge amount of resources to master using geospatial analysis software tools. Even after mastering it, it is not uncommon for the users to have to refer to software documentation frequently for help in performing operations which are not carried out routinely. Ideally, a software should make it easy, especially for those who are already experts in the subject matter being studied, to perform operations without having to spend large amount of time learning the idiosyncrasies of the software. In this poster I will present some of the work that I am doing to create an Ontology based natural language interface to perform geo-spatial analysis. The system currently takes simple

english sentences as input and turns the sentences into SPARQL queries which are applied over an RDF store. More complex queries could be build by combining several sentences together into a "paragraph". On receiving a query which is ambiguous, it searches for probable matches with the given query and ranks them for the users to choose the best match. This system gives a hint that it might be possible to build software for data analysis using natural language programming, at least in a limited domain. Some examples of natural language queries performed over Oceanographic Data will be presented.

Submitted by: Upendra Dadi, NODC, upendra.dadi@noaa.gov

CropScape

Liping Di, Weiguo Han, Zhengwei Yang, Meixia Deng

This poster/demo will show the CropScape, a standard-compliant web service system that analyzes, visualizes, customizes, and disseminates the Crop Data Layer (CDL) and other geospatial data from USDA

Submitted by: Liping Di, Center for Spatial Information Science and Systems, ldi@gmu.edu

Learning about Climate Change and Human-Health Impacts with the CHANGE Viewer

Sneha Rao and Robert R. Downs

With growing concerns about change in climate and the impact it has on the environment we live in, it is important to develop resources for teachers, students and the general public to improve their understanding of global climate change.

Sponsored by NASA's Innovations in Climate Education initiative, the Center for International Earth Science Information Network (CIESIN) at the Earth Institute, Columbia University, and the Institute for the Application of Geospatial Technology (IAGT) at Cayuga Community College have developed an interactive tool known as the Climate and Health ANALysis for Global Education (CHANGE) Viewer.

The CHANGE Viewer is developed on a NASA World Wind Software Development Kit (SDK) that runs on Windows or MAC computers. Using existing web resources, such as the Population Estimation Service, a Web Processing Service (WPS) provided by the NASA Socioeconomic Data and Applications Center (SEDAC), and the Climate Mapper, a monthly climate observation plug-in developed for SERVIR by the University of East Anglia's Climate Research Unit (CRU) and IAGT, the CHANGE Viewer enables users to visualize estimates of people residing at global and local scales affected by change in climatic conditions.

Submitted by: Robert Downs, CIESIN, Columbia University, rdowns@ciesin.columbia.edu

MODIS Web Services: Enabling Automated Standard Access to MODIS Science Data

Robert Wolfe, Ed Masuoka, Larry Gilliam, Ali Rezaian, Neal Most, Cid Praderas, Greg Ederer, Karen Horrocks, Gang Ye, Asas Ullah, Jeff Schmaltz

The teams that serve MODIS Atmosphere and Land Science Data products at NASA Goddard Space Flight Center are developing and deploying a suite of web services to simplify, standardize, and automate searching for and retrieving MODIS science data products, imagery, and metadata. These services include OGC Standard Web Coverage Service, OGC Standard Web Map Service and OpenSearch.org open search service.

Submitted by: Gregory Ederer, SigmaSpace Corp, gederer@sigmaspace.com

CEOS Atmospheric Composition Portal (Demo)

Stefan Falke, Frank Linsday, Chris Lynnes, Greg Leptoukh, Oleg Gousev, Severinne Bernonville, Wenli Yang, Peisheng Zhao, James Johnson

The Atmospheric Composition Constellation (ACC) and the Workgroup for Information Systems and Services (WGISS) within the Committee on Earth Observation Satellites (CEOS) are involved in development efforts

supporting interoperability among the atmospheric composition research and applications communities. The initial effort has resulted in a website prototype that uses a standards-based framework to provide access to remotely sensed atmospheric composition data, metadata and visualization and analysis tools. We are seeking partnerships with other atmospheric composition community members interested in connecting data products, data analytical tools or other capabilities. Please stop by the demonstration and visit <http://wdc.dlr.de/acp/> for more information. Submitted by: Stefan Falke, Northrop Grumman, stefan.falke@ngc.com

An Elemental OPeNDAP Use-Case

Dave Fulker

I focus this poster on the principal motivations and rationale for employing OPeNDAP as a data-provision method, striving to boil the matter down to those points most essential for ESIP members.

Submitted by: Dave Fulker, OPeNDAP, dfulker@opendap.org

Demonstrating preservation connections using OAI-ORE (Funding Friday 2011)

Ruth Duerr and Joe Glassy

The Open Archives Initiative - Object Reuse and Exchange (OAI-ORE) protocol was developed to enable the exchange of information about complex e-science objects. The purpose of this project is to determine whether or not such a protocol is capable of describing and making available information about digital data sets in the Earth sciences. To test these capabilities we intend to test OAI-ORE using provenance and context information for NASA's MODIS instrument. We intend to describe the entire suite of available information as described in the OAIS reference model and further explicated through the USGCRP's report Global Change Requirements for Long-Term Archiving and developing ESIP Provenance and Context Content Standard for at least one of the MODIS Level 3 data products and all of its precursor products. The results of this test will be demonstrated through a very simple web site depicting the connections and describing any problems and successes encountered.

Submitted by: Joseph Glassy, NTSG/FLBS Univ. Montana, um.glassy@gmail.com

Mine Your Data: GLIDER brings data mining to the masses (Demo)

Rahul Ramachandran, Sara Graves, Todd Berendes, Manil Maskey
Information Technology and Systems Center, University of Alabama Huntsville

Satellite imagery can be mined to extract thematic information, which has increasingly been used as a source of information for making policy decisions. The uses of the 'mined' information can vary from military applications such as detecting assets of interest to science applications such as characterizing land-use/land cover change at local, regional and global scales. Mining and extracting thematic information using satellite imagery is a non-trivial task that requires a user to perform complex sequence of steps.

UAHuntsville has developed GLIDER, a freely available tool that simplifies mining of satellite imagery. GLIDER provides a suite of image processing algorithms for imagery enhancement along with pattern recognition and data mining algorithms for both parametric and non-parametric information extraction. This poster will showcase some of GLIDER's many features using four case studies. The first case study will focus on the use of false color composites to highlight and distinguish features of interest within satellite imagery such as smoke. The ability to apply any mathematical formulae on different spectral bands and visualize the result will be covered in the second use case. The third use case will employ unsupervised classification algorithms to segment the image into meaningful classes. The final use case will focus on supervised classification covering sample selection, creating workflows for training, testing and the final application to create a thematic map.

Submitted by: Sara Graves, Univ of Alabama, Huntsville / DAARWG, sgraves@itsc.uah.edu

ECHO and ISO

Ted Habermann

Metadata from ECHO is being translated to ISO and we need your help! Please stop by!

Submitted by: Ted Habermann, National Geophysical Data Center, ted.habermann@noaa.gov

Pre-Mission, Mission and Post Mission Data Management for NASA Field Campaigns

Michael Goodman NASA Marshall Space Flight Center; Danny Hardin, Matt He, Marilyn Drewry, Michele Garrett, Helen Conover, Will Ellett, Lamar Hawkins, Mary Nair, Sherry Harrison, Tammy Smith The University of Alabama in Huntsville

Field research campaigns are essential for observing and measuring actual Earth system phenomena and validating computer models that simulate Earth systems. Ultimately, field data have a wide variety of application in basic and applied research. Due to the nature of data collection during a field campaign the resulting data sets are discontinuous over the designated geographic region as well as in time. The management of aircraft based data must take these factors into consideration.

The Global Hydrology and Resource Center (GHRC) and IT researchers at the University of Alabama in Huntsville have participated in a number of NASA field campaigns since 1998. For example The Genesis and Rapid Intensification Processes (GRIP) experiment was a recent NASA Earth science field experiment conducted in summer 2010 to better understand how tropical storms form and develop into major hurricanes. NASA used the DC-8 aircraft, the WB-57 aircraft, and the Global Hawk Unmanned Airborne System (UAS) configured with a suite of remote sensing instruments used to observe and characterize the life cycle of hurricanes. This campaign capitalized on a number of ground networks, airborne science platforms (both manned and unmanned), and space-based assets.

Due to this history and expected participation in future campaigns; the GHRC is recognized as one of the main NASA data centers for this category of data. At the GHRC data from successive field campaigns are tied together through common procedures, consistent metadata, and archival systems making it easy to access data from instruments that have been employed across several missions. These data are also valuable when preparing for new field campaigns.

This poster presents the data management activities and strategies employed prior to the mission, during the mission and after a mission concludes.

Submitted by: Danny Hardin, University of Alabama Huntsville, dhardin@itsc.uah.edu

Building a Climatology for Coastal Gap Winds and Resulting Ocean Upwelling Events

Ken Keiser, Xiang Li, Deborah Smith, Bruce Beaumont, Thomas Harper

Orographic gap features near coastlines can concentrate regional winds, resulting in increased wind speeds that can affect the local climate. When these focused jets occur at sea level, they can additionally produce localized cold-water upwelling events that can be of interest to research, commercial and military users. The DISCOVER team, a NASA/ MEaSUREs project, have developed an automated intelligent algorithm to detect gap wind and ocean upwelling events at gap locations globally, using Cross-Calibrated, Multi-Platform (CCMP) ocean surface wind product and Optimally Interpolated Sea Surface Temperature (OISST) product. This algorithm is being used to process historical data with the goal of generating a climatology of past and current identified events. The resulting information is being collected and managed by the Global Hydrology Resource Center (GHRC), a NASA DAAC, located in Huntsville, AL. Science expertise on the interpretation of the wind and sea surface temperatures and development of the algorithm is being provided by DISCOVER team members at Remote Sensing Systems in Santa Rosa, CA, and the University of Alabama in Huntsville. This poster presents an overview of the algorithm developed for gap wind and upwelling event detection, the application to selected gap locations around the globe, and the planned approach for providing the resulting climatology to data center customers.

Submitted by: Ken Keiser, University of Alabama in Huntsville, keiserk@uah.edu

Traversing Data Relations Using ESIP Standards (Demo)

Jess Lacy, Ruth Duerr

The ESIP Atom Cast Specification promises a means to discover and access data and services. This demo shows a production application that uses the ESIP Atom Cast Specification to traverse data relations and power a web application.

Submitted by: Jess Lacy, National Snow and Ice Data Center, jess.lacy@nsidc.org

Climate Literacy and Energy Awareness Network (CLEAN)

Tamara Shapiro Ledley, Mark S McCaffrey, Anne U Gold, Susan M Buhr, Cathryn A. Manduca, Sean Fox, Karin Kirk, Marian Grogan, Frank Niepold, Susan Lynds, Cynthia Howell

The US Global Change Research Program and a consortium of science and education partners in 2009 concluded “climate change will bring economic and environmental challenges as well as opportunities, and citizens who have an understanding of climate science will be better prepared to respond to both.” In order for citizens to achieve that understanding there is a clear need to support teachers, students, and the public in becoming climate and energy literate and to enable them to make responsible decisions about the environment and energy use for themselves and for society. However, to pursue climate and energy literacy it is necessary to identify and access educational materials that are scientifically accurate, pedagogically effective, and technically robust, and to use them effectively.

The CLEAN Pathway (<http://cleanet.org>) is a National Science Digital Library (<http://www.nsdl.org>) project that is stewarding a collection of materials for teaching climate and energy science in grades 6-16. The collection contains classroom activities, lab demonstrations, visualizations, simulations and more. Each resource is extensively reviewed for scientific accuracy, pedagogical effectiveness, and technical quality. Once accepted into the CLEAN collection, a resource is aligned with the Climate Literacy Essential Principles for Climate Science, the AAAS Project 2061 Benchmarks for Science Literacy and other national standards. The CLEAN website hosts a growing collection of currently 300+ resources that represent the leading edge of climate and energy science resources for the classroom.

This poster will describe the avenues the CLEAN portal that can help educators improve their own climate and energy literacy and how to effectively integrate the climate and energy principles into their teaching; and the review process that can enable your climate and energy science and technology tools to be made available through the CLEAN portal.

Submitted by: Tamara Ledley, TERC / Climate Literacy Network, Tamara_Ledley@terc.edu

Cloud Computing Use Cases

Rick Martin

As cloud computing becomes more commonplace, the technology becomes less important than the value delivered for mission and users. This poster will highlight some ESIP-relevant uses of cloud with linkages to mobile computing.

Submitted by: Rick Martin, SAIC, richard.a.martin-2@saic.com

Provenance Collection and Display for the AMSR-E SIPS

H. Conover, B. Beaumont, A. Kulkarni, R. Ramachandran, K. Regner, S. Graves, M. Maskey, D. Conway

This project brings together a team of NASA and university researchers with expertise in NASA Earth science data systems, science algorithm development, and provenance collection/dissemination. The team is applying provenance collection and representation tools to the generation of NASA's AMSR-E standard products, with an initial focus on sea ice products. The AMSR-E SIPS generates Level 2 and Level 3 data products from AMSR-E observations, which are key data sets for research in both the Climate Variability and Change and Water and Energy Cycle focus areas. Provenance and context will be presented to the AMSR-E data community via an interactive web application. An initial focus on Sea Ice processing has allowed the project to engage the Sea Ice science team and user community in customizing the provenance tools for NASA Earth science data.

Submitted by: Manil Maskey, University of Alabama in Huntsville, mmaskey@itsc.uah.edu

Real-time Automated Cloud Classification from Live Webcams

Alexander Matus

In the past decade, webcams have become increasingly popular for environmental monitoring. Due to low manufacturing costs and flexibility, outdoor webcam images are currently freely available online for most locations in the United States. The wide availability of webcam images provides a valuable, low-cost resource for weather observations. This study aims to extract real-time quantitative meteorological data from digital imagery. All images are obtained from the rooftop cameras atop the Atmospheric, Oceanic, and Space Sciences (AO&SS) building at the University of Wisconsin-Madison in Madison, WI. First, a feature mask is applied to filter out the land surface below the skyline. An RGB color histogram is generated based on only full-sky pixels. An algorithm is applied to filter out clear sky pixels and classify cloud in the image. Finally, a cloud type classification is performed based on the spectral signature of the RGB color histogram, in which the classification is validated based on satellite measurements. The entire process is completely automated through computer programming. The process of sky classification is a fast, inexpensive, and robust form of weather observation. This technique can be applied to all webcam images to perform a quick classification of sky conditions.

Submitted by: Alexander Matus, Digital Earth Watch, amatus@wisc.edu

Reference Model for Disaster Management

Karen Moe and John Evans

The Committee on Earth Observing Satellites (CEOS), as the satellite arm of GEOSS, provides decision makers access to remote sensing products in support of disasters. The proposed reference model provides an enterprise perspective for managing distributed systems and services for disaster management. (poster presented at AGU FM11).

Submitted by: Karen Moe, NASA ESTO, karen.moe@nasa.gov

ESIP Teacher Workshops

Margaret Mooney and Nina Jackson

This poster will map out the history and accomplishments of the ESIP teacher workshops.

Submitted by: Margaret Mooney, CIMSS/SSEC/UW-Madison, margaret.mooney@ssec.wisc.edu

GEO User Requirements Registry (Demo)

Gary Foley, EPA; Hans-Peter Plag, University of Nevada, Reno; Gregory Ondich, Justin Kaufman, and Ric Blackman, SCG, Inc.

To achieve its goal to be user-driven, building the Global Earth Observation System of Systems (GEOSS) must be guided by a set of explicitly known user needs. At the core of GEOSS is the GEOSS Common Infrastructure (GCI), which includes registries that enable users of Earth observations (EOs) to search, discover, access, and use the data and services available through GEOSS. Three of these registries focus primarily on the contributors to GEOSS. The fourth registry, the User Requirements Registry (URR), is a database for the collection, sharing, and analysis of user needs and EO requirements. The URR also provides a means for efficient dialog between users and providers. The URR is a comprehensive database describing an array of user data, such as user types, applications, requirements, research needs, and technology needs. The novel concept for the URR is in the information captured in the Links form, where relationships between entries in the other forms can be published, including descriptions of the societal benefits of the link and implementation status.

Submitted by: Gregory Ondich, SCG, gondich@scgcorp.com

How to Cite an Earth Science Data Set

Mark A. Parsons and the Preservation and Stewardship Cluster

Creating a great data set can be a life's work (consider Charles Keeling). Yet, scientists do not receive much recognition for creating rigorous, useful data. At the same time, in a post "climategate" world there is increased

scrutiny on science and a greater need than ever to adhere to scientific principles of transparency and repeatability. The Council of the American Geophysical Union (AGU) asserts that the scientific community should recognize the value of data collection, preparation, and description and that data “publications” should “be credited and cited like the products of any other scientific activity.”

Currently, however, authors rarely cite data formally in journal articles, and they often lack guidance on how data should be cited. The Federation of Earth Science Information Partners (ESIP) Preservation and Stewardship Cluster has been working this issue for some time now and has begun to address some of the challenges.

Overall, scientists and data managers have a professional and ethical responsibility to do their best to meet the data publication goals asserted by AGU. This talk outlines a data citation approach to increase the credit and credibility of data producers.

Submitted by: Mark Parsons, National Snow and Ice Data Center, parsonsm@nsidc.org

Create Collaboratories for Earth Science using Talkoot (Demo)

Rahul Ramachandran, Manil Maskey, Ajinkya Kulkarni, Helen Conover, U. S. Nair, S. Movva

Advances in technology allow different research groups and institutions to use new software tools to build and support virtual collaborations and infuse open science. The infusion of these tools into science processes can now enable sharing and publishing of digital scientific artifacts, and, dramatically improve knowledge sharing amongst researchers. These new tools offer the potential to create new virtual research collaboration platforms. Based on scientific interest, these new virtual research collaborations can cut across traditional boundaries such as institutions and organizations. This poster describes Talkoot, a software toolkit designed and developed by the authors. Talkoot provides Earth Science researchers a ready-to-use knowledge management environment and an online platform for collaboration. Talkoot allows Earth Science researchers a means to systematically gather, tag and share their data, analysis workflows and research notes. These Talkoot features are designed to assist rapid knowledge sharing within a virtual community. Talkoot can be utilized by small to medium sized groups and research centers, as well as large enterprises such as a national laboratories and federal agencies.

Submitted by: Rahul Ramachandran, ITSC, rramachandran@itsc.uah.edu

Engaging Climate Change Learners in Public School Settings (Funding Friday 2011)

Jesse Roberts, University of Wisconsin - Madison

Teaching students about energy, carbon emissions, and climate change requires a fundamental knowledge of what we use energy for in our society. It also requires that students understand the relative magnitudes of our current energy sources, and the true environmental cost of using each source. Often, this information is lacking, as it falls outside traditional classroom standards for earth science. A short card game is being developed which tries to convey what we use energy for in the world, and where that energy comes from. It is hoped that after only a few games that students will have a better appreciation for where our energy comes from and where it goes, allowing for a more nuanced discussion on energy efficiency goals and renewable energy development. This FUNDing Friday project pulls data from US, EU, and UN sources, and offers a fine-grained breakdown of energy use by sector. Students are able to play the world as-is, as well as make policy decisions (Ban SUVs, eg.) and explore the costs and benefits of doing so.

Submitted by: Jesse Roberts, University of Wisconsin - Madison, joroberts@wisc.edu

Linking Open Research Data for Earth and Space Science Informatics (Funding Friday 2011)

Eric Rozell and Tom Narock

Earth and Space Science Informatics (ESSI) is inherently multi-disciplinary, requiring close collaborations between scientists and information technologists. Identifying potential collaborations can be difficult, especially with the rapidly changing landscape of technologies and informatics projects. The ability to discover the technical competencies of other researchers in the community can help in the discovery of research partnerships. In addition to collaboration discovery, this data can be used to analyze trends in the field, which will help project managers identify emerging, irrelevant, and well-established technologies and specifications. This information will help keep projects focused on the technologies and standards that are actually being used, making them more useful to the ESSI community. We present a two-part solution to this problem: a pipeline for generating structured data from

ESSI abstracts and an API and Web application for accessing the generated data. We use a Natural Language Processing (NLP) technique, Named Entity Disambiguation, to extract information about researchers, their affiliations, and technologies they have applied in their research. The extracted data is encoded in the Resource Description Framework using Linked Data vocabularies, including the Semantic Web for Research Communities ontology and the Friend-of-a-Friend ontology. The data is exposed in four ways: a SPARQL query-able endpoint, linked data, Java APIs, and a Web application. We also capture the provenance of the data transformations using the Proof Markup Language, including confidence scores from the NLP algorithms used. Our implementation has used only open source solutions, including DBpedia Spotlight and OpenNLP. We plan to set up an open source project for this work so that it can continue to evolve through community contributions.

Submitted by: Eric Rozell, Rensselaer Polytechnic Institute, rozele@rpi.edu

Digital Earth Watch (Funding Friday 2011)

Annette Schloss, Jeff Beaudry, John Pickle, Fabio Carrera

Digital Earth Watch (DEW) involves individuals, schools, organizations and communities in a systematic monitoring project of their local environment, especially vegetation health. The program offers people the means to join the Picture Post network and to study and analyze their own findings using DEW software. A Picture Post is an easy-to-use and inexpensive platform for repeatedly taking digital photographs as a standardized set of images of the entire 360° landscape, which then can be shared over the Internet on the Picture Post website. This simple concept has the potential to create a wealth of information and data on changing environmental conditions, which is important for a society grappling with the effects of environmental change. Picture Posts may be added by anyone interested in monitoring a particular location. The value of a Picture Post is in the commitment of participants to take repeated photographs - monthly, weekly, or even daily - to build up a long-term record over many years. This poster will show examples of Picture Post pictures being used for capturing seasonal plant phenological events and a community project restoring a pond shoreline. DEW is being developed by a collaborative effort led by the University of New Hampshire with the Federation of Earth Science Information Partners, the University of Southern Maine, and Worcester Polytechnic Institute. We invite individuals, schools, informal education centers, groups and communities to join: visit us at <http://picturepost.unh.edu>

Submitted by: Annette Schloss, Univ New Hampshire, annette.schloss@unh.edu

NASA's Global Change Master Directory's Discover and Access Earth Science Data Sets, Related Services, and Climate Diagnostics

Alicia Aleman, Lola Olsen, Scott Ritz, Michael Morahan, Laurel Cepero, Tyler Stevens

NASA's Global Change Master Directory provides the scientific community with the ability to discover, access, and use Earth science data, data-related services, and climate diagnostics worldwide. The GCMD offers descriptions of Earth science data sets using the Directory Interchange Format (DIF) metadata standard; Earth science related data services, are described using the Service Entry Resource Format (SERF); and climate visualizations are described using the Climate Diagnostic (CD) standard. The DIF, SERF and CD standards each capture data attributes used to determine whether a data set, service or climate visualization is relevant to a user's needs. Metadata fields include: title, summary, science keywords, service keywords, data center, data set citation, personnel, instrument, platform, quality, related URL, temporal and spatial coverage, data resolution and distribution information. In addition, nine valuable sets of controlled vocabularies have been developed to assist users in normalizing the search for data descriptions. An update to the GCMD's search functionality is planned to further capitalize on the controlled vocabularies during database queries. By implementing a dynamic keyword "tree", users will have the ability to search for data sets by combining keywords in new ways. This will allow users to conduct more relevant and efficient database searches to support the free exchange and re-use of Earth science data. <http://gcmd.nasa.gov/>

Submitted by: Tyler Stevens, NASA Global Change Master Directory, Tyler.B.Stevens@nasa.gov

Retrospective analog year analyses using NASA satellite data, a metric of improvements to USDA world agricultural estimates

William Teng, Harlan Shannon

The USDA World Agricultural Outlook Board (WAOB) is responsible for monitoring weather and climate impacts on domestic and foreign crop development. One of WAOB's primary goals is to determine the net cumulative effect of weather and climate anomalies on final crop yields. To this end, a broad array of information is consulted, including maps, charts, and time series of recent weather, climate, and crop observations; numerical output from weather and crop models; and reports from the press, USDA attachés, and foreign governments. The resulting agricultural weather assessments are published in the Weekly Weather and Crop Bulletin, to keep farmers, policy makers, and commercial agricultural interests informed of weather and climate impacts on agriculture. Because both the amount and timing of precipitation significantly impact crop yields, WAOB often uses precipitation time series to identify growing seasons with similar weather patterns and help estimate crop yields for the current growing season, based on observed yields in analog years. Although, historically, these analog years are identified through visual inspection, the qualitative nature of this methodology sometimes precludes the definitive identification of the best analog year. One goal of this study is to introduce a more rigorous, statistical approach for identifying analog years. This approach is based on a modified coefficient of determination, termed the analog index (AI). The derivation of AI will be described. Another goal of this study is to compare the performance of AI for time series derived from surface-based observations vs. satellite-based measurements (NASA TRMM and other data). Five study areas and six growing seasons of data were analyzed (2003-2007 as potential analog years and 2008 as the target year). Results thus far show that, for all five areas, crop yield estimates derived from satellite-based precipitation data are closer to measured yields than are estimates derived from surface-based precipitation measurements. Work is continuing to include satellite-based surface soil moisture data and model-assimilated root zone soil moisture. This study is part of a larger effort to improve WAOB estimates by integrating NASA remote sensing observations and research results into WAOB's decision-making environment.

Submitted by: William Teng, NASA GES DISC (Wyle IS), William.I.teng@nasa.gov

NEON: Transforming Environmental Data into Information for Societal Benefit

Brian Wee

The National Ecological Observatory Network (NEON), or the Observatory, is a NSF funded national investment in physical and information infrastructure. The Observatory's goal is to enable understanding and forecasting of the impacts of climate change, land use change and invasive species on continental-scale ecology by providing physical and information infrastructure to support research, education and environmental management in these areas. NEON provides vetted and authoritative data and information to scientists, educators, decision makers and the public on how land use, climate change and invasive species affect biodiversity, disease ecology, and ecosystem processes. NEON high-level data products are designed to enable ecological forecasts and analyses at a continental scale and facilitate the observation of decadal scale changes against a background of seasonal-to-interannual variability. We foresee that NEON's partners will utilize these products as input to advanced models that will help inform resource management, socio-economic analyses, environmental risk management, and decision support for climate change mitigation and adaptation.

Submitted by: Brian Wee, NEON, Inc., bwee@neoninc.org

Development and Implementation of NASA ISO Geographic Metadata

Benjamin White, Evelyn Nakamura, Ted Haberman

The International Organization for Standardization/Technical Committee on Geographic Information/Geomatics' (ISO/TC211) standard for geographic metadata, ISO 19115, was finalized in 2003. Since then, its use has grown both within the US and globally. After an extensive review process, NASA's Earth Science Data and Information System (ESDIS) Project determined that its stakeholders would benefit if it were also to adopt ISO 19115 (Aleman, et al. 2011). This poster explores the impacts of adopting ISO 19115, how the standard's implementation will effect the flow of metadata within ESDIS and some of the initial steps being explored in the implementation process.

Submitted by: Benjamin White, Raytheon, Benjamin.White-NR@raytheon.com

Geoportal Server & Portal for ArcGIS: Disambiguation

Christine White, Esri

'Portal' has been a buzzword of late, and there are many projects using geoportal technology. This poster describes two well known Esri portal products: The Esri Geoportal Server, and the Portal for ArcGIS. It will outline features of each, use cases for choosing which technology, and important example implementations.

Submitted by: Christine White, Esri, cwhite@esri.com

Picture Post Newsletter: An Opportunity for Outreach

Haley F Wicklein, Annette L Schloss

The Picture Post environmental monitoring project is a citizen science initiative funded by NASA to create opportunities for informal and formal science educators and the community-at-large to collaborate by sharing digital photographs from Picture Post sites. The purpose of our project was to develop a newsletter to serve the Picture Post community. The newsletter includes information about the Picture Post website, examples of how members are using images from their Posts, and a space for the community to respond and offer suggestions. The newsletter arose from requests for feedback by picturepost users, and will provide an opportunity for outreach to and interaction within the community.

Submitted by: Haley Wicklein, Digital Earth Watch, hwicklein@abernail.sr.unh.edu

Service, Dataset, and Event Casting (Demo)

B. Wilson, G. Manipon, A. Kulkarni, R. Ramachandran, K. Keiser, S. Graves

Demonstrate a variety of Casting and Discovery interfaces:

- 1) A smart authoring tool to write service casts
- 2) A one-stop search box for smart discovery of datasets and services across casts, GCMD and ECHO
- 3) Faceted navigation and drill-down for Earth Science datasets

Submitted by: Brian Wilson, Jet Propulsion Lab, Brian.Wilson@jpl.nasa.gov

Towards a Domain Specific Software Architecture for Scientific Data Distribution

Anne Wilson, Doug Lindholm

A reference architecture is a 'design that satisfies a clearly distinguished subset of the functional capabilities identified in the reference requirements within the boundaries of certain design and implementation constraints, also identified in reference requirements.' [Tracz, 1995] Recognizing the value of a reference architecture, NASA's ESDSWG's Standards Process Group (SPG) is introducing a multi-disciplinary science data systems (SDS) reference architecture in order to provide an implementation neutral, template solution for an architecture to support scientific data systems in general [Burnett, et al, 2011]. This reference architecture describes common features and patterns in scientific data systems, and can thus provide guidelines in building and improving such systems. But, guidelines alone may not be sufficient to actually build a system. A domain specific software architecture (DSSA) is 'an assemblage of software components, specialized for a particular type of task (domain), generalized for effective use across that domain, composed in a standardized structure (topology) effective for building successful applications.' [Tracz, 1995]. It can be thought of as relatively specific reference architecture. The 'DSSA Process' is a software life cycle developed at Carnegie Mellon's Software Engineering Institute that is based on the development and use of domain-specific software architectures, components, and tools. The process has four distinct activities: 1) develop a domain specific base/model, 2) populate and maintain the library, 3) build applications, 4) operate and maintain applications [Armitage, 1993]. The DSSA process may provide the missing link between guidelines and actual system construction. In this presentation we focus specifically on the realm of scientific data access and distribution. Assuming the role of domain experts in building data access systems, we report the results of creating a DSSA for scientific data distribution. We describe the resulting domain model and our efforts towards building a heterogeneous, multi-'vendor' architecture framework for data distribution based on that model. We draw on experiences and lessons learned supporting data access and distribution for multiple projects having common functionality but also unique details. References: [Armitage, 1993] Armitage, James, 'Process Guide for the DSSA Process Life Cycle', Software Engineering Institute, paper 240, <http://repository.cmu.edu/sei/240>, December, 1993. [Burnett, et al, 2011] Burnett, Michael, Weiss, Barry, Law, Emily, 'NASA's ESDS Reference Architecture', AGU Fall Meeting, San Francisco, CA, December 2011. [Tracz, 1995] Tracz, Will, 'DSSA (Domain Specific Software Architecture) Pedagogical Example', ACM SIGSOFT Software Engineering Notes V20 N3, July 1995.

Submitted by: Anne Wilson, LASP, anne.wilson@lasp.colorado.edu

Meta-Analysis of User Needs for Precipitation Data

Erica Zell, Adam Carpenter, Stephanie Weber

Precipitation data is needed for a diverse range of users and applications, and was highlighted as a priority observation for all Group on Earth Observation (GEO) Societal Benefit Areas analyzed under GEO Task US-09-01a. Many users have come to rely on precipitation data, whether historical data, near real-time data, or forecasts, and whether measured via rain-gauges, ground-based radars, or satellites. The users of precipitation data range from large hydro-meteorological services monitoring and forecasting weather, to health officials forecasting malaria outbreaks and private sector insurance specialists helping farmers manage their risk. Our study team conducted a literature review and engaged with GEO Communities of Practice and other organizations such as the World Meteorological Organization to assess users' required characteristics (e.g., spatial and temporal resolution, accuracy, and timeliness) of precipitation data. The study results identify commonalities in need across user types, and test case study scenario configurations of observing systems to meet common needs. This analysis serves as a prototype in collecting user needs for a given observation, and could be expanded to include a larger number of user group consultations and/or to focus on observation priorities other than precipitation.

Submitted by: Erica Zell, Battelle, zelle@battelle.org

Speaker Bios

Lawrence Friedl, NASA, Director of the Applied Sciences Program

Lawrence Friedl serves as the Director of the Applied Sciences Program within NASA's Earth Science Division. The Program supports efforts to discover and demonstrate innovative and practical applications of Earth science by public and private organizations'. He has been with the NASA Applied Sciences Program since 2002. He has served as the Program Manager for Air Quality applications along with several other applications themes (Coastal Management, Climate, Water Resources).

Among his responsibilities, Lawrence represents NASA in the interagency Civil Applications Committee and represents the United States on the international Group on Earth Observations (GEO). He leads a GEO task which delivered a report on the Earth observation priorities common to many societal benefit areas.

Prior to joining NASA, Lawrence worked at the US Environmental Protection Agency, focusing on applications of geospatial data and technology. He also served as a Space Shuttle Flight Controller in NASA's Mission Control Center for 15 missions, including several Earth science missions.

Lawrence received a Masters degree in Public Policy from Harvard University's Kennedy School of Government, specializing in Science and Technology Policy. He received a Bachelors degree in Mechanical & Aerospace Engineering from Princeton University. He also received a certificate in Space Policy and Law from the International Space University.

Gary Foley, EPA, Senior Advisor in the Immediate Office of the Assistant Administrator for Research and Development

Dr. Foley currently is a Senior Advisor in the Immediate Office of the Assistant Administrator for Research and Development as of 2011. Prior to that, he served as EPA's Earth Observation Executive in the newly expanded Office of the Science Advisor. In these roles, he oversees a team that brings together expertise in measurements, observations, models and decision-support tools and how these bring science into decision-making. The ORD-Region1 Narragansett Bay Pilot Project that began in mid-2011 is a new effort that he coleads for ORD. From 2005 to 2007, Dr. Foley was the Director of the National Center for Environmental Research, where he launched two new exploratory research programs including the innovative program in Biodiversity and Human Health. Before that he was the first Director of the National Exposure Research Laboratory beginning in April 30, 1995. Both the Center and the Laboratory are within the Office of Research and Development (ORD) of the U.S. Environmental Protection Agency. For almost two years in 1993-94, he served as the Acting Assistant Administrator for ORD. He has been in ORD for most of his 38 year career at EPA, working within different laboratories and offices on a broad set of environmental research areas focusing on engineering, monitoring, modeling, systems thinking and integrated analysis across the risk paradigm. He has continually been involved in promoting new research approaches, such as integrated modeling, air quality forecasting, sustainability and decision-making, and utilizing the ORD wind tunnel facility to understand complex urban environments. For three years in the late 70's, EPA loaned him to the Organization for Economic Cooperation and Development (OECD) to work on international air pollution, acid rain and energy-environment issues. As a leader of EPA research for over 30 years, he formed many interagency and international partnerships to enhance research success. Earlier in his career, he worked for Amoco for five years in the research and development department on chemical and petroleum process modeling and optimization.

Dr. Foley was appointed as the United States Co-Chair on the User Requirements and Outreach Sub-Group of the ad-hoc Group on Earth Observations (GEO) in 2003. Two years later when the Ministers launched GEO, this sub-group was replaced by the User Interface Committee, which he co-chairs. Dr. Foley is the recipient of the Meritorious Executive Presidential Rank Award, four EPA Bronze Medals, and six Special Achievement Awards. He received a Bachelor of Science degree from Manhattan College in New York. He holds Master and Doctoral of Science degrees in chemical engineering from the University of Wisconsin.

Kevin Gallagher, USGS, Associate Director, Core Science Systems

Mr. Gallagher serves as the Associate Director, Core Science Systems and oversees the USGS' Geologic Mapping, Geological and Geophysical Data Preservation, Geospatial, Biological Information, and Science Informatics

Programs as well as the world's largest Earth Science Library. From 2002-2010, Mr. Gallagher served as the USGS Chief Information officer and Chief Technology Officer where he oversaw the operation of information technology systems and networks supporting bureau wide computing and telecommunications.

Before joining the USGS, Mr. Gallagher held a number of information technology and management positions at various Federal agencies, including Chief, Operations Division, U.S. Coast Guard Operations Systems Center, where he oversaw the development and operations of computer systems supporting Search and Rescue, Environmental Protection, Marine Safety, and Law Enforcement; and Software Developer with the Department of the Navy and Naval Research Laboratory, where he developed computer applications supporting Research and Development and Environmental Preparedness, Prevention and Response.

Mr. Gallagher has written articles on software development and the role of information technology in enhancing mission performance and has coauthored a number of strategic plans including the USGS 10-year science strategy entitled, Facing Tomorrow's Challenges, U.S. Geological Survey Science in the Decade 2007-2017.

Mr. Gallagher holds a Master of Science, Information Systems degree from Syracuse University, a Chief Information Officer Certificate from the National Defense University, and a Bachelor of Science degree in Management Information Systems from James Madison University. He has also completed the Harvard Senior Executive Fellows Program at Harvard University.

Adrian R. Gardner, NASA, Director of Information Technology and Communications Directorate and Chief Information Officer

Mr. Adrian R. Gardner's Federal career is distinguished by over 20 years of federal service enabling mission capability and readiness within the Scientific and Defense-related sectors in an innovative and secure manner. Mr. Gardner was the recipient of 2005 Federal 100 award, which honors individuals from government, industry, and academia whose ideas and accomplishments had the greatest impact in shaping the missions, solutions, and results achieved by the government information technology community.

Mr. Gardner is a member of the Senior Executive Service and currently serves as the Director of the Information Technology and Communications Directorate (ITCD) and Chief Information Officer (CIO) for the Goddard Space Flight Center. As such, he is responsible for providing the GSFC workforce the information infrastructure and tools that adapt and evolve to effectively and securely support management, science, research, and technology programs; developing, implementing, and operating specialized IT systems to support NASA mission planning and operation; and providing systems that disseminate information to the public and that preserve NASA's information assets. Other recent IT leadership positions Mr. Gardner has held include:

- Chair of POC Working Group for DATA.GOV, May '10 to present
- Chief Information Officer for the National Weather Service, Jan. '07 to Feb. '10
- Deputy Associate CIO for IT Reform, Department of Energy, Oct. '06 to Jan. '07
- Deputy Associate CIO for Cyber Security, Department of Energy, Sep. '05 to Sep. '06

Also, from January 2004 to September 2005, Mr. Gardner led the Department's Cyber Security Program through a major expansion in size and scope, incorporating many new missions and security initiatives. Mr. Gardner is a Doctoral Candidate at the University of Southern California, School of Public Policy and Planning where he holds a Masters degree in Public Administration. He also holds a Master of Science degree in Environmental Studies from Hood College and is the recipient of an honorary doctorate degree, also from Hood College. Mr. Gardner holds a Bachelor of Science in Biological Science and Ecology from the esteemed Tuskegee Institute. Mr. Gardner serves on the Board of the District of Columbia Urban League and is a volunteer and mentor to several academic and youth programs.

An Air Force veteran, Mr. Gardner was commissioned as a Launch Control Officer in 1986 and served with distinction until he separated in 1989 and was honorably discharged in 1994. He received the Air Force Achievement Medal in 1987.

William Gunn, Mendeley, Head of Academic Outreach

William has been engaged in creating the future of science from the start. As a young child, he was fascinated by futuristic stories of science in Omni Magazine and Wired, leading him to get my PhD in the cutting edge field of stem cell biology. His first-hand experience with the inefficiencies and antiquities of "modern" academic research led him to join the team at Mendeley where he works on bringing modern network efficiencies to academic research.

His PhD work at Tulane involved self-guided experimental research on the relationship between Human Adult Stem Cells and multiple myeloma. His areas of expertise are bone biology, multiple myeloma, adult stem cells, animal models of bone disorders, and assay development. He previously served as the senior Assay Development Scientist at Genalyte, Inc, responsible for development of macro- and small molecule assays on the platform.

Jack Kaye, NASA, Associate Director for Research of the Earth Science Division

Jack Kaye currently serves as Associate Director for Research of the Earth Science Division (ESD) within NASA's Science Mission Directorate (SMD). He has been a member of the Senior Executive Service since August, 1999, managing NASA's Earth Science Research Program. Earlier positions in his more than 27-year career at NASA include being a Space Scientist at the Goddard Space Flight Center and Manager of the Atmospheric Chemistry Modeling and Analysis Program at NASA HQ. In addition, he has held temporary acting positions as Deputy Director of ESD and Deputy Chief Scientist for Earth Science within SMD. His academic training is in chemistry (B.S. Adelphi University, 1976; Ph.D., California Institute of Technology, 1982). He also held a post-doctoral research associateship at the US Naval Research Laboratory. As Associate Director for Research, Dr. Kaye is responsible for the research and data analysis programs for Earth System Science, covering the broad spectrum of scientific disciplines that constitute it.

He represents NASA in many interagency and international activities and has been an active participant in the US Global Change Research Program (USGCRP) in which he has served for several years as NASA principal and Vice Chair of the Subcommittee on Global Change Research (from Jan., 2009 through May, 2010 he served as the Acting Chair for these activities). He also serves as NASA's representative to the Senior Users' Advisory Group for the National Polar Orbiting Operational Environmental Satellite System and to the Subcommittee on Ocean Science and Technology. He recently completed a six-year term as a member of the Steering Committee for the Global Climate Observing System and currently serves an ex officio member of the National Research Council's Roundtable on Science and Technology for Sustainability. He has received numerous NASA awards (most recently, the Outstanding Leadership Medal in 2009), as well as been recognized as a Meritorious Executive in the Senior Executive Service in 2004 and 2010, and named as a Fellow by the American Meteorological Society in 2010. He was elected to serve as co-secretary of the Atmospheric Sciences Section of the American Geophysical Union (AGU) for 1998-2000 and earlier served on the AGU Publications Committee. The AGU has recognized him on two occasions with a Citation for Excellence in Refereeing. He has published more than 50 refereed papers, contributed to numerous reports, books, and encyclopedias, and edited the book *Isotope Effects in Gas-Phase Chemistry* for the American Chemical Society. In addition, he has attended the Leadership for Democratic Society program at the Federal Executive Institute and the Harvard Senior Managers in Government Program at the John F. Kennedy School of Government at Harvard University.

Timothy Killeen, NSF, Assistant Director for and Past President American Geophysical Union

Born in Cardiff, Wales, Killeen received a BSc in Physics and a Ph.D. in Atomic and Molecular Physics from the University College, London. Killeen came to NSF under an Intergovernmental Personnel Act (IPA) assignment in July 2008 as Assistant Director for Geosciences. Prior to NSF, Killeen was Director of the National Center for Atmospheric Research (NCAR) for eight years, and remains as a Senior Scientist in NCAR's High Altitude Observatory, where his research interests include the experimental and theoretical study of the Earth's upper atmosphere. He came to NCAR from the University of Michigan where he was Professor of Atmospheric and Space. During his tenure at Michigan, he also held positions as Director of the University of Michigan's Space Physics Research Laboratory and Associate Vice President for Research.

Killeen is Past President of the American Geophysical Union (AGU), a Fellow of the American Meteorological Society (AMS), a former AMS Councilor, and a member of the National Academy of Engineering. Killeen has served as President of the Space Physics Section of the American Geophysical Union, and on numerous NASA, NSF, AGU and university committees. He served as co-chair of the NASA Sun-Solar System Connection Strategic Roadmap Committee, and is a past Editor-in-Chief of the *Journal of Atmospheric and Solar-Terrestrial Physics*.

Edward Maiback, Center for Climate Change Communication (4C), Director

Ed joined the George Mason University faculty in 2007 to create the Center for Climate Change Communication. Trained in public health and communication, he has extensive experience as an academic researcher and as a

communication and social marketing practitioner in government, business, and the non-profit sector. His research focuses on the broad question of how public engagement in climate change can be expanded and enhanced. Ed is currently a Principal Investigator on several climate change education grants funded by the National Science Foundation and the Robert Wood Johnson Foundation. He also currently serves on the National Climate Assessment Development and Advisory Committee and advises a wide range of organizations on how to improve their climate change communication, education and outreach.

Previously, Ed served as associate director of the National Cancer Institute, worldwide director of social marketing for Porter Novelli, chairman of the board for Kidsave International, and as a faculty member at Emory and George Washington universities. He earned his doctoral degree at Stanford University and his MPH at San Diego State University, and has published over 100 peer-reviewed journal articles and book chapters. His edited book *Designing Health Messages* earned a distinguished book award from the National Communication Association. In 2010, Ed was awarded George Mason University's highest honor: distinguished University Professor.

Zdenka Saba Willis, NOAA, Director of the U.S. Integrated Ocean Observing System (IOOS)

Zdenka Saba Willis is the Director of the U.S. Integrated Ocean Observing System (IOOS®) Program. Mrs. Willis is a retired Navy Captain with career service as a Meteorology and Oceanography officer in the United States Navy. She has a background in the collection of oceanographic data onboard the USNS Harkness and USNS Maury survey vessels and in the electronic navigational charting as Deputy Navigator of the Navy. As the director of U.S. IOOS, Mrs. Willis leads a coordinated network of people that work with technology and ocean observers to generate and disseminate continuous data on our coastal waters, Great Lakes, and oceans. With IOOS serving as the U.S. contribution to the Global Earth Observing System (GOOS); Mrs. Willis also has a leadership role within the GOOS U.S. Regional Alliance. Mrs. Willis' experience and expertise allows her to represent IOOS and NOAA in two additional platforms: the Interagency Ocean Observing Committee (IOOC) and the U.S. Global Earth Observations (GEO). All of her roles support and promote NOAA and IOOS' observing activities on a regional, national and global level.

Remote Meeting Information

Jan 4, Plenary Session

Register for session: <http://bit.ly/tM6KeR>

Jan 5, Plenary Session

Register for session: <http://bit.ly/ty6m1f>

Energy: Dynamic Decision Tools Catalog and Community of Practice

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Geoportal Server: Open Source Software for Data Discovery and More

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1. Click join next to the meeting name. (Note: If the meeting has not yet started, join will not be visible, and it will say 'Display Info'. Wait a minute and refresh screen)
2. Enter your name and email address
3. If you are asked for a password, enter the access code: 23117220 with no spaces or #.

To join the audio portion of the Conference meeting:

Call-in toll-free number (US/Canada): 1-877-668-4493

Attendee access code: 231 172 20 #

Technology Tools that Enhance Collaboration: Solutions from Climate Change Education Initiatives

Remote Participation Information:

Call-in via phone:

1-866-910-4857 (Toll free)

Participant passcode: 251399

To join the session, please click on the link below within 30 minutes of the specified time:

<https://sas.illuminate.com/m.jnlp?sid=853&password=M.9F5103BA09DA3EDA0834795E64DB5F>